

What is claimed is:

1. A fuel cell system comprising:

5 a fuel tank configured to store a fuel at a pressure higher than atmospheric pressure;

 a vaporizer configured to vaporize the fuel;

 a reformer configured to reform the vaporized fuel into a hydrogen rich gas;

10 a CO gas removal apparatus configured to remove CO gas in the hydrogen rich gas; and

 a cell unit configured to generate electricity by allowing the hydrogen rich gas to react with oxygen.

15 2. The fuel cell system of claim 1, wherein the cell unit includes:

 a fuel electrode being supplied with the hydrogen rich gas;

 an air electrode being supplied with oxygen so as to react with hydrogen rich gas and to generate electricity; and

20 a polymer film interposed between the fuel electrode and the air electrode.

3. The fuel cell system of claim 1, wherein the saturated vapor pressure of the fuel at room temperature is higher
25 than atmospheric pressure.

4. The fuel cell system of claim 1, wherein the fuel includes
a solution of dimethyl ether and water.
5. The fuel cell system of claim 1, wherein inside of the
5 vaporizer is pressurized to a pressure higher than
atmospheric pressure by the saturated vapor pressure
acting in the fuel tank.
6. The fuel cell system of claim 1, wherein a semipermeable
10 membrane to filter out hydrogen selectively is located in
the CO gas removal apparatus.
7. The fuel cell system of claim 1, wherein the CO gas removal
apparatus houses a CO removal catalyst to convert CO gas
15 into the other gas.
8. The fuel cell system of claim 1, further comprising a
pressurized tank connected to an upstream side of the fuel
tank.
- 20 9. The fuel cell system of claim 8, wherein the fuel tank
includes a solution of methanol and water.
10. A fuel cell system comprising:
25 a fuel tank configured to store a fuel at a pressure
higher than atmospheric pressure;

a reformer configured to reform the fuel into a hydrogen rich gas;

a water tank configured to store water to be supplied to the reformer, being coupled to the fuel tank;

5 a vaporizer configured to vaporize the water in the water tank;

a CO gas removal apparatus configured to remove CO gas in the hydrogen rich gas; and

a cell unit configured to generate electricity by
10 allowing the hydrogen rich gas to react with oxygen.

11. The fuel cell system of claim 10, wherein the cell unit includes:

a fuel electrode being supplied with the hydrogen rich gas;

15 an air electrode being supplied with oxygen so as to react with hydrogen rich gas and to generate electricity; and

a polymer film interposed between the fuel electrode and the air electrode.

20 12. The fuel cell system of claim 10, wherein the saturated vapor pressure of the fuel at room temperature is higher than atmospheric pressure.

13. The fuel cell system of claim 10, wherein the fuel
25 includes dimethyl ether.

14. The fuel cell system of claim 10, wherein the fuel includes methanol.

15. The fuel cell system of claim 10, wherein the water tank
5 comprising:
a first chamber coupled to an upper part of the fuel tank;
a second chamber coupled to an upstream of the vaporizer;
and
a partition disposed between the first chamber and the
10 second chamber.

16. The fuel cell system of claim 10, wherein the inside
of the vaporizer is pressurized to a pressure higher than
atmospheric pressure by the saturated vapor pressure
15 acting in the fuel tank.

17. The fuel cell system of claim 10, wherein a
semipermeable membrane to filter out hydrogen selectively
is located in the CO gas removal apparatus.

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18. The fuel cell system of claim 10, wherein the CO gas
removal apparatus houses a CO removal catalyst to convert
CO gas into the other gas.

25 19. The fuel cell system of claim 10, wherein an air tank
is coupled to an upstream side of the CO gas removal

apparatus.

20. The fuel cell system of claim 10, further comprising
a pressurized tank connected to an upstream side of the
5 fuel tank.

21. The fuel cell system of claim 20, wherein the fuel tank
includes a methanol.

10 22. The fuel cell system of claim 20, wherein the fuel tank
includes an ethanol.

23. The fuel cell system of claim 11, further comprising
a first oxygen supply unit configured to supply oxygen to
15 the cell unit having:

a first chamber coupled between the CO gas removal
apparatus and a fuel electrode of the cell unit;

a second chamber connected to an air electrode of the cell
unit; and

20 a partition disposed between the first chamber and the
second chamber.

24. The fuel cell system of claim 23, further comprising
a heat pipe interposed between the first oxygen supply unit
25 and the cell unit.

25. The fuel cell system of claim 23, further comprising a fluid cylinder located at an upstream side of the first chamber.
- 5 26. The fuel cell system of claim 25, wherein a surface area of a second partition disposed in the fluid cylinder is smaller than the partition disposed in the oxygen supply unit.
- 10 27. The fuel cell system of claim 23, wherein a first buffer tank is coupled to an upstream side of the first chamber and a second buffer tank is coupled to a downstream side of the second chamber.
- 15 28. The fuel cell system of claim 23, wherein a check valve is coupled to the second chamber.